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GB 0289067 A GB 0242931 A

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(71) Applicant
Toddler U Inc

(Incorporated in the USA - New York)

257 Riverside Avenue, Westport, Connecticut, United States of America

(72) Inventor
Jeffrey Silverman

(74) Agent and/or Address for Service
Beresford & Co
2-5 Warwick Court, High Holborn, London, WC1R 5DJ, United Kingdom

(54) Measuring a young child's foot

(57) This invention is related to a method and apparatus for determining the properly sized footwear for a young child's foot. This includes measuring the length and circumference of the young child's foot. The circumference is measured along a generally circumferential line located at a distal region of the foot. This measurement is used to select a footpad for insertion into selected footwear. The circumference measurement is obtained by the use of a template, eg 26, or by the use of a tape measure.

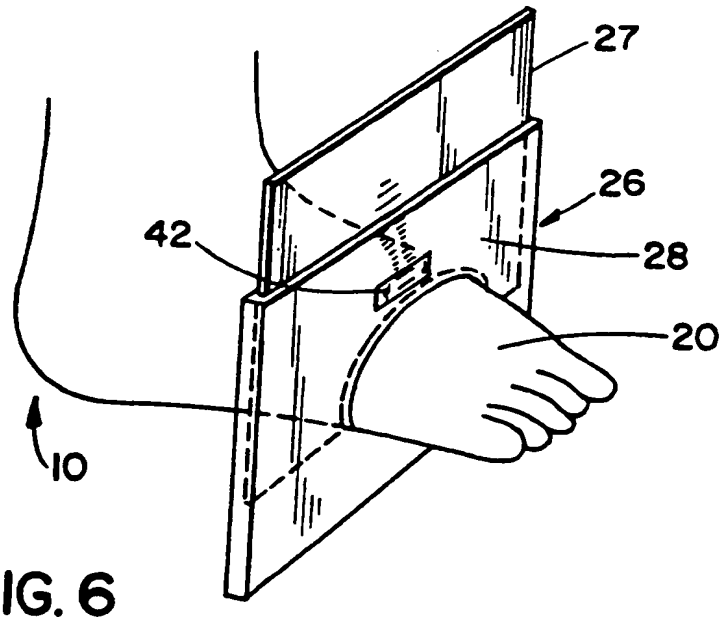

FIG. 6

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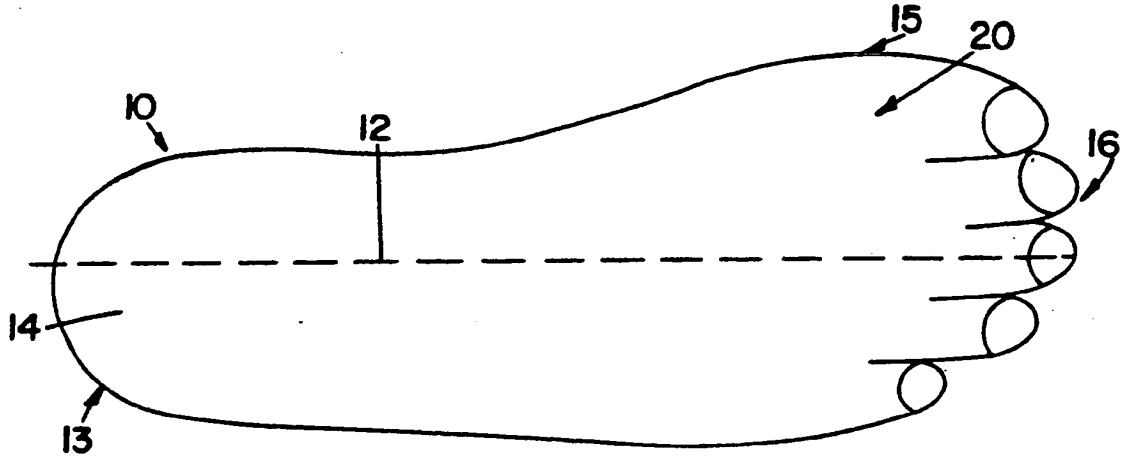

FIG. 1

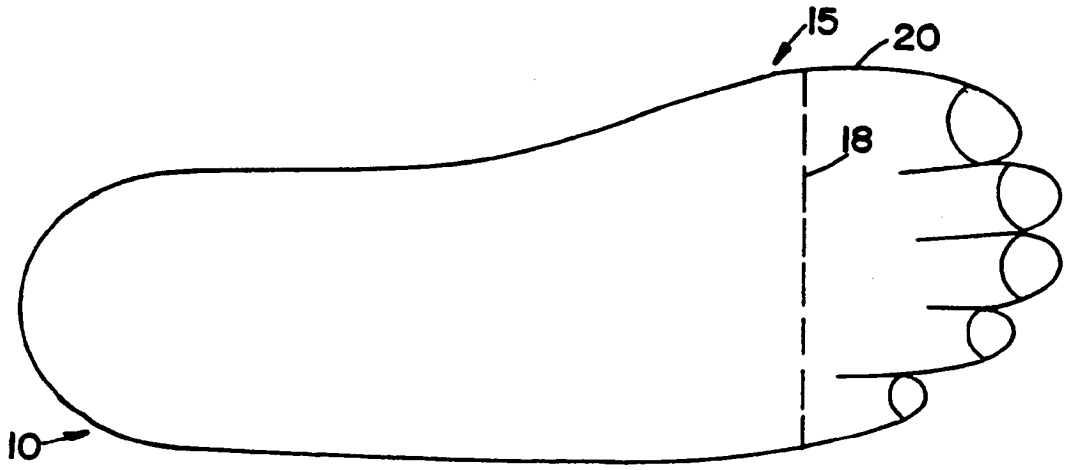

FIG. 2

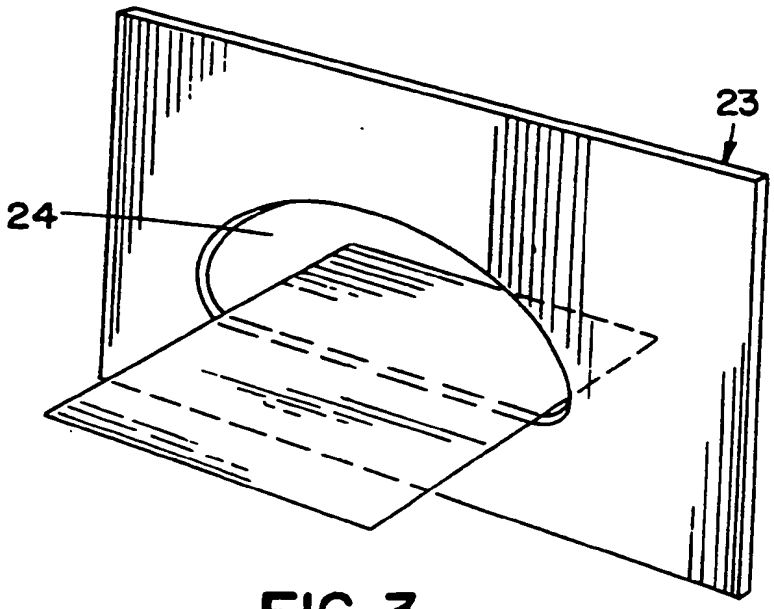

FIG. 3

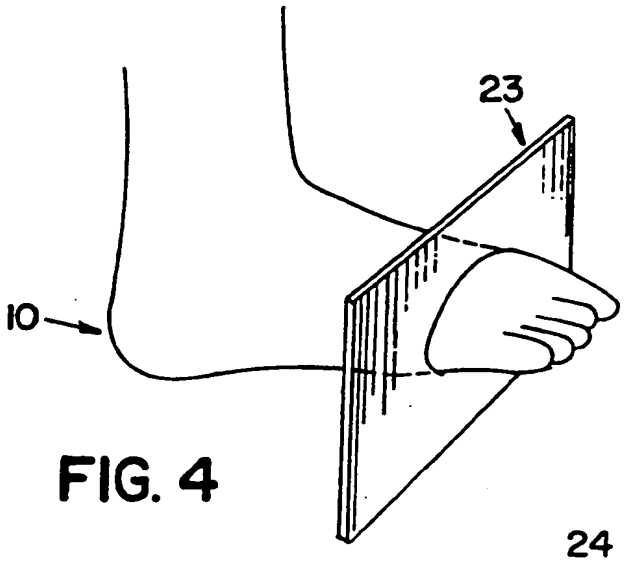

FIG. 4

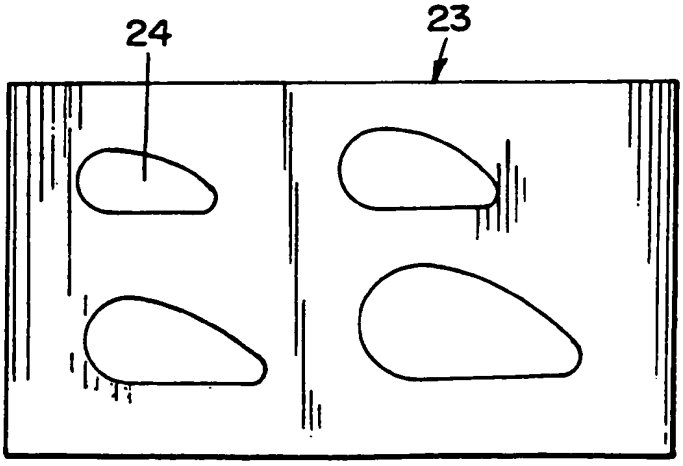

FIG. 5

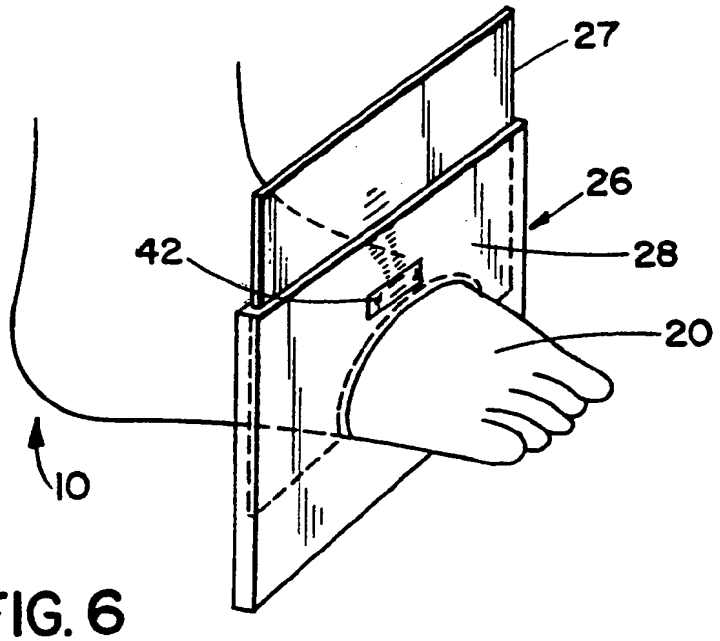

FIG. 6

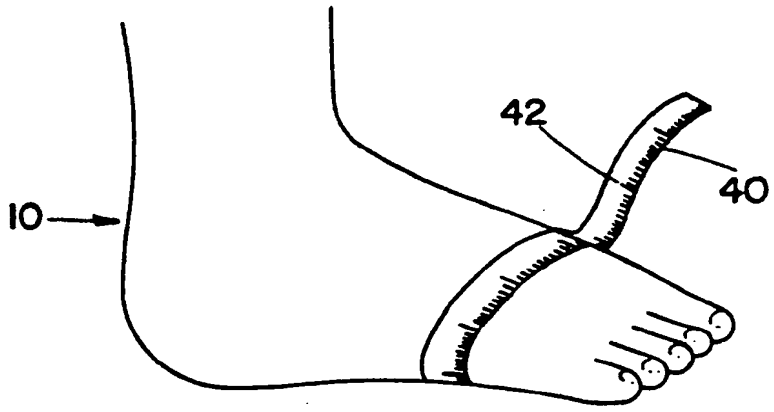

FIG. 7

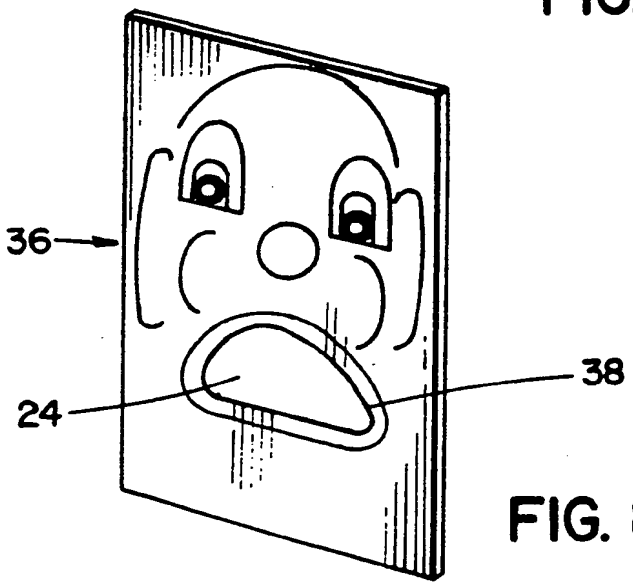

FIG. 8

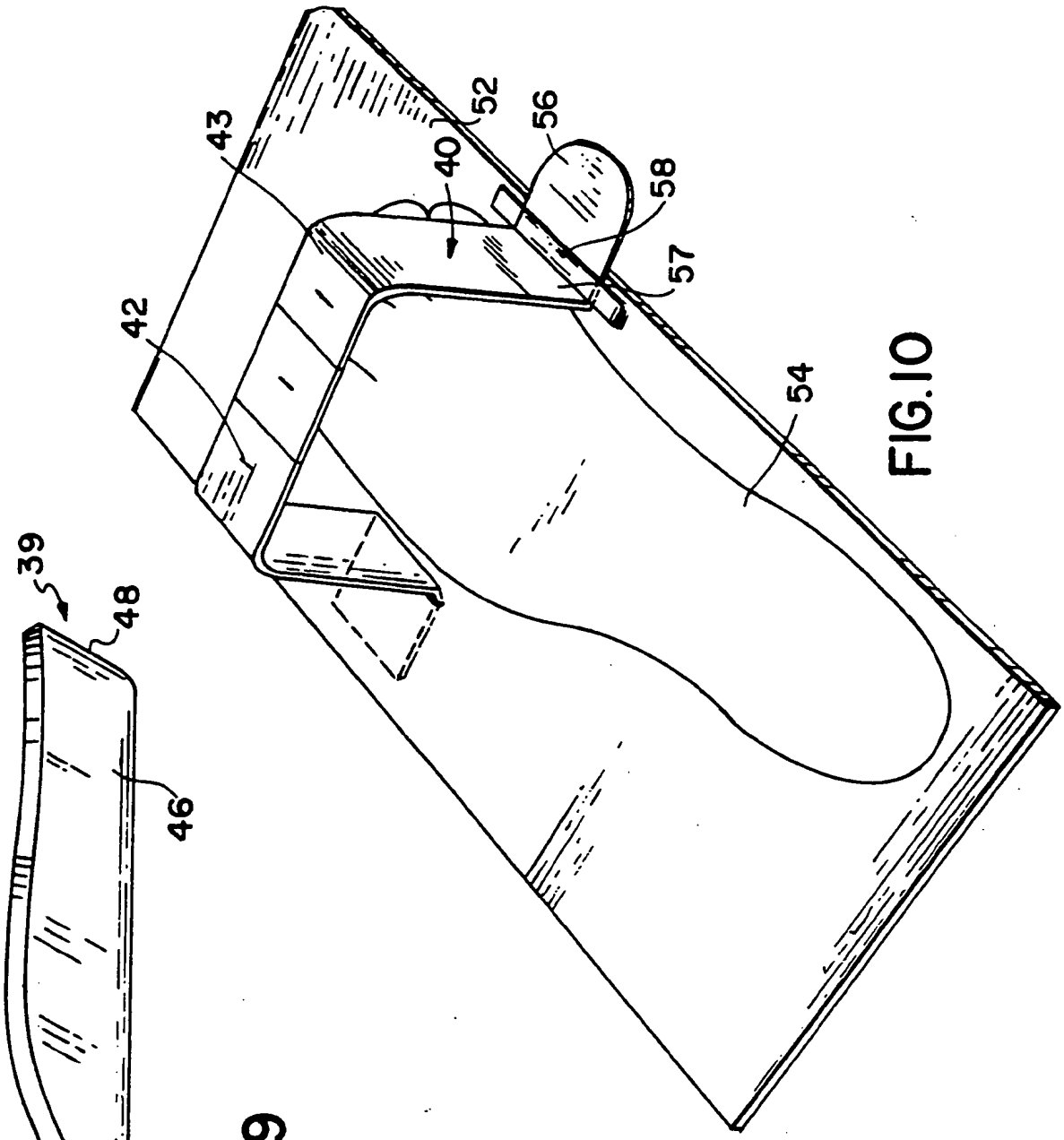

FIG.10

FIG.9

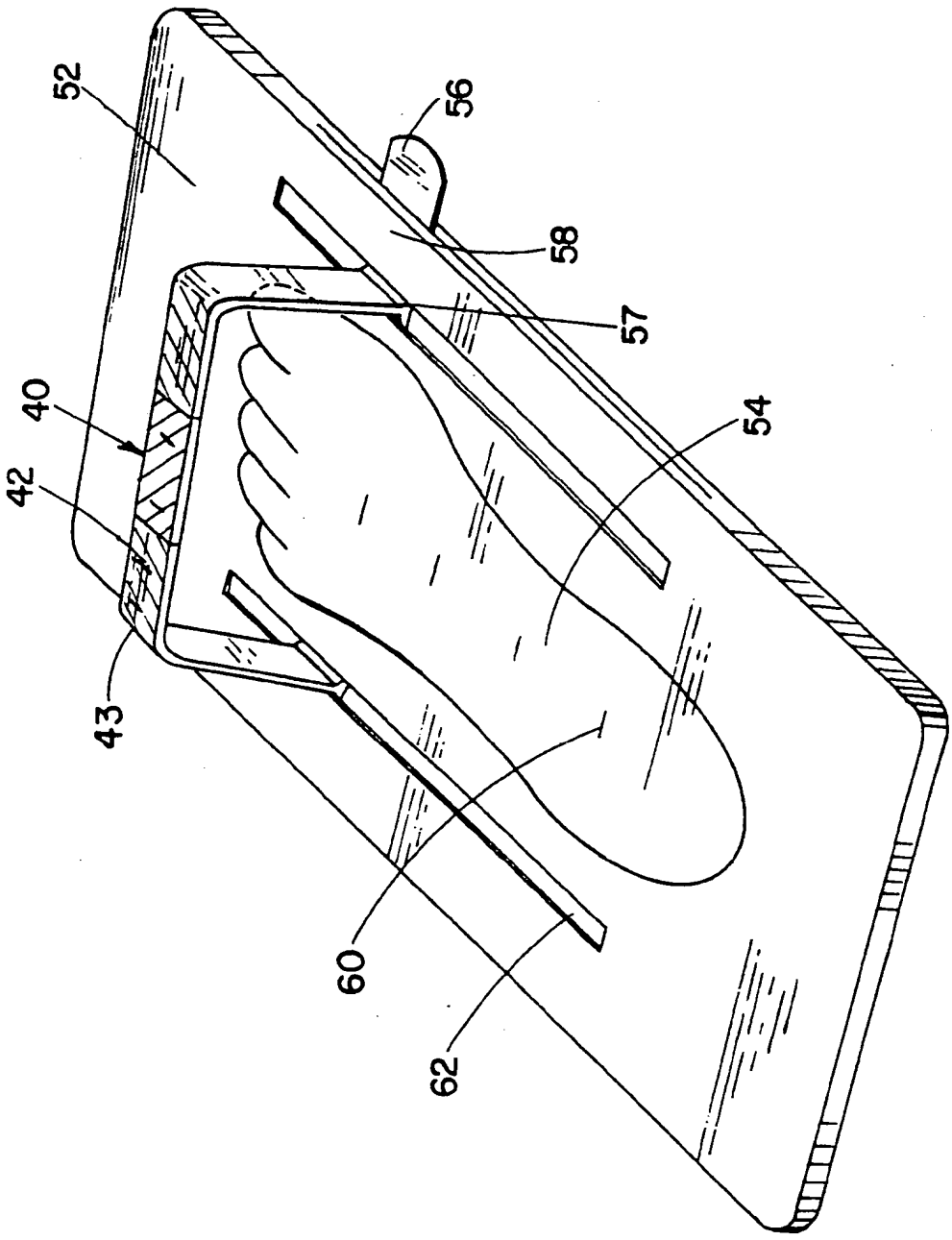

FIG. II

APPARATUS AND METHOD FOR MEASURING A YOUNG CHILD'S FOOT

This invention pertains to the field of properly measuring parts of the human body. Particularly, this invention relates to a method and apparatus for measuring a young child's foot for properly fitting footwear. More particularly, this invention takes into account the anatomical construction of a young child's foot as compared to an adult's foot or older child's foot in connection with selecting properly fitting footwear.

At birth a human's foot is not well developed in terms of shape or form. Generally speaking, the shape of an infant's foot is more akin to a pod or paw than to an adult foot. Even as the infant grows through its first four to seven years of life, its foot only slowly resembles the shape and form of an adult foot. Indeed, the growth process of such a young child's foot is different from older children and teenagers. Only upon reaching a certain age, usually in the range of ages four to nine years, does a young human's foot substantially resemble a small version of an adult foot. From this time forth, the foot grows principally in length--that is, along a longitudinal axis--as compared to growth in width--that is, along a latitudinal axis. As a result of this longitudinal growth, new footwear for children is required usually because the length of a foot increases during growth, mandating the purchase of new footwear. It is for the measure of this type of longitudinal growth and for the accommodation of feet of adult conformation that standard methods and apparatuses for measuring feet have been designed to date.

Prior to four to nine years of age, a human foot grows differently. During this time, a child's foot may grow in girth or circumference as rapidly as or more rapidly than it grows in length. Also during this time, a substantial anatomical change takes place during which the human foot takes its adult conformation. It is interesting that this transformation of a human foot to

its basic adult conformation more or less coincides with the development of walking skills.

The human foot is a wells-designed walking mechanism. The stress and flex points of the foot are designed to accommodate the stresses and flexes associated with walking. However, prior to the bipedal locomotion of adults (whether running, walking, hopping, or skipping), young humans first crawl and toddle. Toddling refers to the awkward gait of young humans as they waddle from foot to foot before their balance is sufficiently developed to achieve the usual motions associated with human bipedal locomotion. The early conformation of a human foot appears to be well adapted for crawling and toddling, which cause the foot to stress and flex differently than when the foot is used for walking. This anatomical development and resultant conformational change has long been observed by parents and health care workers.

Traditionally, despite the aforementioned observations, footwear for young children whose feet do not yet resemble or have the conformation of adult feet have not taken these differences into account. In particular, they have not taken into account the different conformation of a young child's foot as compared to an adult foot. Instead, young children's footwear have simply been downsized versions of adult footwear. The same has been true for methods and apparatuses used for measuring feet to determine properly sized footwear.

Only recently has footwear been specifically designed to accommodate the structural differences of young children's feet. An example of footwear particularly designed for young children is disclosed in United States Patent No. 4,724,623. The footwear disclosed therein exerts little or no pressure on the sides of a young child's foot and allows sufficient toe room that when the child stands, the foot can assume the same position as though the child were barefoot.

Despite the advent of such footwear as disclosed in United States Patent No. 4,724,623, the problem of properly measuring a young child's foot for properly fitting footwear has not been solved. The problem is principally twofold. First, fitting a young child's foot must take into account the nonadult anatomy and conformation of a young child's foot. This being so, traditional adult shoe measuring apparatuses are inadequate. Second, young children tend to squirm and otherwise writhe while having their feet measured for footwear. This is simply the result of a young child's dislike of forced manipulation and/or confinement. When these two problems are combined, the result is oftentimes the purchase of improperly fitting young children's footwear.

The instant invention solves these problems by providing for the measuring of a young child's foot to select properly sized footwear. The invention particularly solves the problem of taking into account the nonadult aspects of a young child's foot. Moreover, the instant invention is adaptable to an apparatus that permits the accurate measuring of a young child's foot with minimal discomfort to the child and, as a result thereof, minimum discomfort to the parent and footwear salesperson. The foregoing is accomplished by devising a method of measuring a young child's foot that takes into account the distinct anatomical conformation and growth of a young child's foot through the measuring of the circumference or girth of the foot rather than merely its length. This method is facilitated through the use of a flexible measuring device or a template specifically designed for measuring the circumference of a child's foot for the purpose of fitting footwear. An apparatus has also been invented to facilitate measuring a child's foot for properly fitting footwear.

According to the present invention, there is provided a method for fitting footwear to a young child's foot comprising selecting footwear based upon a

measurement of or estimation of the length of a child's foot; measuring the circumference of a young child's foot along a generally circumferential line, said circumferential line being along a latitudinal axis at a distal region of said child's foot, to establish a girth measurement; and selecting a footpad of appropriate predetermined size based on said girth measurement for insertion into said footwear.

There is also provided according to the invention apparatus for determining the properly sized footwear for a young child's foot comprising at least one template having an opening therein of a predetermined periphery for determining a girth measurement of a young child's foot along a generally circumferential line extending latitudinally along the top and bottom of said child's foot at a distal region thereof.

In order that the invention may be fully understood, it will now be described with reference to the accompanying drawings in which:

Figure 1 is an elevational view of a young child's foot;

Figure 2 is a elevational view of a young child's foot;

Figure 3 depicts a fixed template apparatus used for determining the girth measurement of a young child's foot;

Figure 4 depicts a fixed template apparatus in use for the measuring of a young child's foot;

Figure 5 depicts a fixed template apparatus having a plurality of openings;

Figure 6 depicts a conformable template apparatus in use in determining the girth measurement of a young child's foot;

Figure 7 depicts a flexible measuring apparatus in use to determine the girth measurement of a young child's foot;

Figure 8 depicts an apparatus with ornamentation for determining the girth measurement of a young child's foot;

Figure 9 depicts a footpad in side view;

Figure 10 depicts a perspective view of a foot-measuring apparatus; and

Figure 11 depicts a perspective view of a foot-measuring apparatus.

The method and apparatus disclosed herein are designed to measure a young child's foot to permit selection of properly sized footwear for the young child. As used herein, a "young child" is a child having a foot whose anatomical structure and/or conformation has not yet reached the developmental stage wherein such a foot is a small version of an adult's foot. The age range that usually reflects this anatomical conformation is four to nine years old or, more usually, five to eight years old, and most commonly, six to eight years old. Thereafter, there is a transformation of the foot from a conformation associated with a young child to a conformation that is a small version of an adult foot.

The feet of young children principally differ in conformation from adult feet by the general lack of structural definition of the young child's foot and by the different nature of growth in a young child's foot as compared to the growth of a nonyoung child's foot. Respecting the former difference--that is, the difference of structural differentiation--a young child's foot is usually more round and ill-defined than a nonyoung child's foot so that there is no clear structural definition of, for instance, an ankle region, an instep region, or an arch region. This lack of structural definition is evidenced by the recognition that most young children, especially toddlers, have relatively wide feet. It has been estimated that 80 percent of all toddlers require footwear having an "E" or greater width. As to the second difference,

young children's feet tend to grow more quickly in width or latitudinal direction than do the feet of nonyoung children. In particular, a young child's foot may grow in width as rapidly as or more rapidly than the foot grows in length.

In addition to anatomically related differences, young children use their feet differently than nonyoung children. Of course, when first born, young children do not use their feet at all for locomotion. However, as is commonly known, within the first few months after birth, young children begin using their feet for support and shortly locomotion. This initial locomotion is not bipedal but rather is quadripedal. In other words, young children crawl before they walk.

In the process of learning to walk, children first crawl and then toddle. When engaged in crawling and/or toddling movements, the foot of a young child is subjected to different stresses and flexing than the foot would be subjected to in the normal gait associated with human walking. These different requirements for foot flexing and stress may serve to partially explain why young children's feet are not simply small versions of adult feet. This invention takes into account all of the foregoing in disclosing a method and apparatus for measuring a young child's foot to ensure the selection of properly sized and, therefore, properly fitting footwear.

The method and apparatus of this invention are principally, although not exclusively, directed to taking into account the relatively wide width of a young child's foot by measuring the girth thereof. By such measurement, the present invention provides for selection of properly fitting children's footwear. Selection of properly fitting footwear results in healthier feet and will increase the comfort of a young child, both making the child less irritable and

encouraging the child to use its feet for support and for locomotion.

Attendant with measuring a young child's foot for the selection of properly fitting footwear, one must inevitably confront the fact that young children do not enjoy, indeed oftentimes dislike, having their feet measured. This may be attributed to a large number of factors, but certainly prime among them is that determining the proper fit of a young child's foot requires confinement and/or manipulation of the young child's foot by a stranger such as a footwear salesperson. In recognition of this considerable difficulty and with the goal of allaying a young child's discomfort and anxiety at having its foot measured, this invention allows for the measurement of a young child's foot with minimal confinement and manipulation. Indeed, certain aspects of this invention provide for a means of measuring a young child's foot that the child may well find a pleasant and game-like experience. This is accomplished by providing as a part of an apparatus for measuring a young child's foot ornamentation of the apparatus that suggests to the child that a game is being played not that its foot is being measured.

Referring now to the drawings, wherein like reference numerals represent like elements, there is shown a young child's foot generally designated by the reference numeral 10. The dimensions of the young child's foot 10 may be approximated by the dimensions of a longitudinal axis 12 which basically runs the length of the foot from the proximal end 13, which includes the heel region 14, to the distal end 15 of the foot, which includes the joint region 20 and, at the most distal end thereof, includes the toe region 16. The other dimension of the young child's foot 10 is determined by the latitudinal axis 18, which extends across the distal end 15 of the foot usually along the top of the joint region 20. As Figure 2 demonstrates, it is about this joint region 20 that the girth of a young child's

foot 10 is measured, similar to the traditional position that is used to measure the width of an adult's foot.

When measuring the young child's foot 10 for properly fitting footwear, it is critical to measure the girth of the foot. Heretofore, the girth of a child's foot was not measured. At most, a rough determination of width was taken. It is important to understand that the instant invention does not measure width but girth. That is, the girth measurement is taken along a line that extends around the entire foot. Moreover, the girth measurement is taken for each lengthwise size of a young child's foot. In particular, the girth measurement is taken on a latitudinal axis 18 preferably about the joint region 20.

In addition to determining such a girth measurement, a measure along the longitudinal axis 12 of a young child's foot 10 is also required to properly fit footwear. Measurement about such a longitudinal axis 12 is accomplished by a generally lengthwise line that extends along the maximum length of the foot from the heel region 14 of the proximal end 13 to the most distant toe region 16 of the distal end 15. Proper fitting of footwear to the young child's foot 10 based on the foregoing measurements is accomplished by taking the measurement obtained along the longitudinal axis 12 of the foot 10 and the measure obtained along the latitudinal axis 18 of the foot and, based thereon, selecting appropriate footwear.

An additional function of selecting appropriate footwear in accordance with this invention is the selection of an appropriate footpad generally depicted by the numeral 39. The footpad 39 comes in a variety of sizes designed to accommodate a variety of girth measurements of a child's foot. For instance, it is currently envisioned that the footpad 39 will come in three sizes--narrow, medium, and wide--each size referring to the general girth measurement of a child's foot; that is, whether the girth measurement of a

child's foot reflects the fact that the relative girth measurement for a foot with a particular length measurement is a wide, medium, or narrow girth measurement.

The footpad 39 is designed to be inserted into a piece of footwear. Therefore, the footpad 39 structurally resembles the sole of a piece of footwear in that the footpad comprises an arch support region 41, a toe support region 44, and a heel support region 46 that includes a raised heel backing portion 48. Each footpad 39, regardless of its girth measurement dimension, is made to correspond to a predetermined footwear length measurement size so that the footpad may be easily inserted into the footwear and so that the footpad properly conforms to a young child's foot. In a marketplace environment, each piece of footwear can be sold with three different footpads 39, each footpad corresponding to the length measurement of the particular piece of footwear with which the footpads are enclosed.

The correlation between the measured girth measurement of a young child's foot and the selection of the appropriate footpad 39 can be facilitated by marking the footpad with the particular girth measurement to which it corresponds and the length measurement to which it corresponds. For example, the footpad 39 will have displayed on it the girth measurement, e.g. wide, medium, or narrow, to which the footpad corresponds. Such display can be accomplished by writing one of the words "wide," "medium," "narrow," or words with similar meanings on the a footpad 39 or by color coding a footpad to correspond to a particular girth measurement size. In the latter display, each size is denoted by a particular color, i.e. wide would be red, medium would be blue, and narrow would be green. Of course, it will be understood that any combination of color and girth measurement can be acceptable.

The apparatus of this invention as embodied is to facilitate the measuring of a young child's foot 10 using at least one opening 24. It is a principal aim of the apparatus to provide a girth measure of the young child's foot 10 and also to provide a lengthwise measure of the child's foot.

One example of such an apparatus is a fixed template apparatus that is generally depicted by reference numeral 23 shown in Figure 3. The fixed template apparatus 23 includes at least one opening or lumen 24. The opening or lumen 24 can take a variety of shapes so long as the shapes are adaptable to receiving a young child's foot 10. However, it will be understood that the opening 24 is shaped to accommodate a girth that corresponds to a certain shoe configuration adapted to a young child's foot having a narrow, medium, or wide girth. A fixed template 23 having an opening 24 is shown receiving a young child's foot 10 in Figure 4.

The opening 24 of the fixed template apparatus 23 has a predetermined periphery or perimeter measure that determines the girth measurement allowing selection of properly fitting footwear. The predetermined periphery or perimeter measurement can be, and oftentimes is, correlated to specific pieces of footwear. At minimum, once the periphery measure or girth measure of the foot 10 is known, properly fitting footwear can be selected.

In order to accommodate the various sizes and shapes that a young child's foot 10 can take, it is necessary to provide a means to accommodate different sizes of a child's foot. Such accommodation can be accomplished in a variety of ways. For instance, in an embodiment of the fixed template 23, the template can be designed with a plurality of openings 24. Each opening is designed to accommodate a different girth size of the young child's foot 10. In the preferred embodiment, the fixed template 23 having a plurality of openings 24 may be used whatever the lengthwise measure of the young

child's foot 10. For instance, if the lengthwise measure of the young child's foot 10 is a size 6, there will be three openings 24 corresponding to narrow, medium, and wide girth measurements so that the footwear salesperson can determine the properly sized footwear predicated upon the girth measurement. The different sizes of the openings 24 can be made to accommodate variations in both the width of the foot 10 and the length of the foot.

A fixed template 23 having a plurality of openings 24 is depicted in Figure 5. If the fixed template apparatus 23 has only one opening 24, then a footwear salesperson would be expected to have a plurality of such apparatuses, each with a different girth measurement so that the salesperson can select the appropriately sized apparatus.

In the alternative, the openings 24 of apparatus can be designed to accommodate different girth sizes of a child's foot 10 by making the openings variably and selectively adjustable. A variety of mechanisms can be used to accomplish this. One such mechanism is the conformable template apparatus 26 shown in Figure 6. The conformable template 26 is designed to be adaptable about the periphery of the young child's foot 10. It is most preferred that the conformable template apparatus 26 be used to measure the young child's foot 10 about the joint region 20 of the foot along the latitudinal axis 18. Use of the conformable template slide 27 of apparatus 26 is accomplished by sliding or otherwise moving the conformable template slide 27 into a proper position adjacent or in contact with the foot 10, thereby providing for the taking of the girth measurement of the foot. After the conformable template slide 27 is moved into place about the foot 10 and the footwear salesperson is satisfied that the fit about the foot is proper, the salesperson examines the side portion 28 of the conformable template to determine the appropriate size of the footwear-to be

selected by reading the appropriate girth measuring units 42 from the side portion.

Regardless of its template configuration, the apparatus will, in its currently preferred embodiment, comprise an ornamental design 36 on the front side thereof, which design is pleasing and comforting to a young child.

In another preferred embodiment, the greatest anxiety mitigation of a child and the greatest comfort factor for a child is accomplished by having the ornamental design 36 resemble a clown's face. The precise features of the clown face embodiment of the ornamental design 36 would be accomplished by placing the depiction of lips 38 about the opening 24 of the apparatus. This would give the impression to a young child that the opening 24 of the apparatus is nothing more than a clown's mouth, thereby minimizing or reducing the anxiety, squirming, or discomfort associated with measuring a foot 10 for properly fitting footwear. A flat support can be adapted to the ornamental design 36 as exemplified by the clown's face by painting the flat support red and shaping it to resemble a tongue so that when the child places his foot in the opening 24 depicting a clown's mouth, the child can, when placing its foot on the flat support, imagine that it is placing its foot on the tongue of a clown.

Another example of an apparatus for determining the girth measurement of a young child's foot 10 is a flexible measuring apparatus 40 having marked thereon girth measuring units 42. The measuring apparatus 40 must have sufficient flexibility to substantially conform to the uneven surfaces of the young child's foot 10. Once the measuring apparatus 40 is generally conformed to the periphery of the foot 10, it is used in a manner identical to a standard tape measure except that instead of making a reading in inches, centimeters, or any extant measuring units, the girth measurement of the young child's foot measured

along the latitudinal axis 18 is made by reading the girth measuring units 42. The girth measuring units 42 are preferably designated narrow, medium, or wide but can be more specifically designated by more particularly defined measuring units. In a preferred embodiment, the measuring apparatus 40 has printed thereon both girth measuring units 42 and another standard unit of measure such as inches or centimeters. This embodiment is preferred because the flexible measuring apparatus 40 can be used by a footwear salesperson to determine both the girth measurement of the foot 10 as well as the lengthwise measure of the foot. In addition, the footwear salesperson need use or carry with him only one measuring device regardless of the age of the child and/or customer in the store. If the customer is a young child, the footwear salesperson can make use of the girth measuring units 42 on the measuring apparatus 40. If the customer is other than a young child, the footwear salesperson can use the same measuring apparatus 40 and use only the known measuring units printed thereon, ignoring the girth measuring units 42.

In the currently preferred embodiment for determining the appropriate girth measurement of a young child's foot 10, a foot-measuring apparatus generally depicted by the numeral 50 can be used. Two particular embodiments of the measuring apparatus 50 are shown in Figures 10 and 11. The foot-measuring apparatus 50 includes a template 52 that is designed to receive a young child's foot. It is envisioned that the template 52 will have thereon a pictorial representation of a foot 54 to encourage a young child to place his foot on top of the template. The template 52 can include a variety of fanciful, ornamental designs to facilitate use of the measuring apparatus 50 by a young child. Engaged on the template 52 is a flexible measuring apparatus 40. The flexible measuring apparatus 40 includes girth measuring means such as the

girth measuring units 42 or a predetermined color code 43 corresponding to particular girth measurements. If a footpad or similar construction is used, it can also be color coordinated to correspond to a particular girth measurement.

The flexible measuring apparatus 40 includes a tab region 56, which can be used to adjust the flexible measuring means about the upper portion of a distal region of a young child's foot 10. The template 52 includes a securing means 58 under which the tab region 56 and other regions of the flexible measuring apparatus 40 can be placed to provide an anchor for the flexible measuring means to the measuring apparatus 50.

Actual taking of the girth measurement using the measuring apparatus 50 requires adjusting the flexible measuring apparatus about the child's foot at a distal region thereof and then reading the appropriate girth measurement at a predetermined site 57 on the measuring apparatus 50. Preferably, the predetermined site 57 is actually on the flexible measuring apparatus 40 at a location convenient for a footwear salesperson to read, such as at the point of the securing means 58 that moveably secures the flexible measuring apparatus 40 to the template 52. If it is unclear precisely what size is appropriate, as would be the case if the measure of the child's foot 10 is in between two girth measurement sizes of the predetermined site 57, then the footwear salesperson will have to determine which size provides the most proper fit for the young child's foot. In most instances, the larger size would be selected.

In an alternative embodiment of the measuring apparatus 50, the apparatus can be used for both determining a girth measurement and a length measurement of a young child's foot. This embodiment, which is shown in Figure 11 and includes a template 52 having length measurement units 60 placed thereon denoting a length measurement corresponding to the traditional

notion of footwear "size," permits the determination of a girth measurement of a young child's foot 10 in the same manner as the aforediscussed embodiment of the foot-measuring apparatus 50 except that the flexible measuring apparatus 40 component of the measuring apparatus will require additional markings for the girth measurement units to correspond to varying length measurements. The additional marking will be designed to accommodate the fact that each girth measuring unit will have to correlate with a particular length measurement as does each footpad 40. This being the case, the flexible measuring apparatus 40 will have denoted thereon the appropriate girth measuring size to correspond with the appropriate length measurements. This is depicted on the flexible measuring apparatus 40 of Figure 11 in which each length measuring size has girth measuring units 42 corresponding thereto.

The location of the flexible measuring apparatus 40 must be aligned in accordance with the length measurement of the young child's foot 10 so that the flexible measuring apparatus is positioned at a distal portion of the young child's foot to effectuate the taking of a proper girth measurement. Proper positioning of the flexible measuring apparatus 40 is achieved by moving the flexible measuring apparatus to the aforesaid distal position of the young child's foot. The movement is accomplished by locating the flexible measuring apparatus 40 on a movable member such as the track 62 so that the measuring apparatus 40 can move along the template 52.

It will be understood that the embodiments described herein are merely exemplary and that a person skilled in the art may make any variations and modifications without departing from the spirit and scope of the claimed invention. All such modifications and variations are intended to be included in the scope of the invention, as defined in the appended claims.

CLAIMS:

1. A method for fitting footwear to a young child's foot characterized by the steps of:

selecting footwear based upon a measurement of or estimation of the length of a child's foot;

measuring the circumference of a young child's foot along a generally circumferential line, said circumferential line being along a latitudinal axis at a distal region of said child's foot, to establish a girth measurement; and

selecting a footpad of appropriate predetermined size based on said girth measurement for insertion into said footwear.

2. A method according to Claim 1, characterized in that said footpad is marked with a preselected color, said preselected color corresponding to said girth measurement.

3. Apparatus for determining the properly sized footwear for a young child's foot characterized by at least one template (23, 26 or 36) having an opening therein of a predetermined periphery for determining a girth measurement of a young child's foot along a generally circumferential line extending latitudinally along the top and bottom of said child's foot at a distal region thereof.

4. The apparatus of Claim 3 characterized in that said template includes a selectively movable member (27) for determining the girth measurement of said child's foot.

5. The apparatus of Claim 3 or 4 characterized in that said template includes an ornamental design intended to be pleasing and comforting to a young child.

6. A method for fitting footwear to a young child's foot substantially as hereinbefore described with reference to one or more of the figures of the accompanying drawings.

7. Apparatus for determining the properly sized footwear for a young child's foot, arranged, constructed and adapted to operate substantially as hereinbefore described with reference to one or more of the accompanying drawings.

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